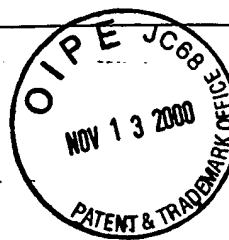


RECEIVED

SEQUENCE LISTING



NOV 16 2000

TECH CENTER 1999/2000

<110> LOCARNINI, STEPHEN A
BARTHOLOMEUSZ, ANGELINE I
AYE, THEIN T
DEMAN, ROBERT A

<120> VIRAL VARIANTS AND METHODS FOR DETECTING SAME

<130> 2551-28

<140> 09/306,420

<141> 1999-05-06

<150> PCT/AU97/00520

<151> 1997-08-15

<150> PO3519

<151> 1996-11-08

<160> 57

<170> PatentIn Ver. 2.0

<210> 1

<211> 20

<212> DNA

<213> Hepatitis B virus

<400> 1

ggagtgtgga ttgcactcc

20

<210> 2

<211> 17

<212> DNA

<213> Hepatitis B virus

<400> 2

gctccaaatt ctttata

17

<210> 3

<211> 20

<212> DNA

<213> Hepatitis B virus

<400> 3

cctttacccc gttgcccggc

20

<210> 4

<211> 17

<212> DNA

<213> Hepatitis B virus

<400> 4

2731

C

gctccaaatt ctttata

17

<210> 5

<211> 23

<212> DNA

<213> Hepatitis B virus

<400> 5

gccgcgtcgc agaagatctc aat

23

<210> 6

<211> 20

<212> DNA

<213> Hepatitis B virus

<400> 6

ggttctatcc taaccttacc

20

<210> 7

<211> 23

<212> DNA

<213> Hepatitis B virus

<400> 7

gcctcatttt gtgggtcacc ata

23

<210> 8

<211> 21

<212> DNA

<213> Hepatitis B virus

<400> 8

tgggggtgga gccctcaggc t

21

<210> 9

<211> 20

<212> DNA

<213> Hepatitis B virus

<400> 9

cacaacattc caccaagctc

20

<210> 10

<211> 18

<212> DNA

<213> Hepatitis B virus

<400> 10

aaattcgcag tccccaac

18

28 32

C

<210> 11
<211> 19
<212> DNA
<213> Hepatitis B virus

<400> 11
gtttccctct tcttgctgt 19

<210> 12
<211> 21
<212> DNA
<213> Hepatitis B virus

<400> 12
ttttcttttg tctttgggta t 21

<210> 13
<211> 21
<212> DNA
<213> Hepatitis B virus

<400> 13
ccaacttaca aggcctttct g 21

<210> 14
<211> 23
<212> DNA
<213> Hepatitis B virus

<400> 14
catcgtttcc atggctgcta ggc 23

<210> 15
<211> 19
<212> DNA
<213> Hepatitis B virus

<400> 15
gtttccctct tcttgctgt 19

<210> 16
<211> 21
<212> DNA
<213> Hepatitis B virus

<400> 16
atacccaaag acaaaagaaa a 21

<210> 17
<211> 550
<212> DNA

29 33

C

<213> Hepatitis B virus

<220>

<221> CDS

<222> (1)..(549)

<400> 17

tct tcc aat ttg tcc tgg tta tcg ctg gat gtg tct gcg gcg ttt tat	48
Ser Ser Asn Leu Ser Trp Leu Ser Leu Asp Val Ser Ala Ala Phe Tyr	
1 5 10 15	
cat att cct ctt cat cct gct gct atg cct cat ctt ctt att ggt tct	96
His Ile Pro Leu His Pro Ala Ala Met Pro His Leu Leu Ile Gly Ser	
20 25 30	
tct gga tta tca agg tat gtt gcc cgt ttg tcc tct aat tcc agg atc	144
Ser Gly Leu Ser Arg Tyr Val Ala Arg Leu Ser Ser Asn Ser Arg Ile	
35 40 45	
aac aac aac atg caa aac ctg cac gac tcc tgc tca agg caa ctc tac	192
Asn Asn Asn Met Gln Asn Leu His Asp Ser Cys Ser Arg Gln Leu Tyr	
50 55 60	
gtt tcc ctc atg ttg ctg tac aaa acc tac gga gag aaa ttg cac ctg	240
Val Ser Leu Met Leu Leu Tyr Lys Thr Tyr Gly Glu Lys Leu His Leu	
65 70 75 80	
tat tcc cat ccc atc gtc ctg ggc ttt cgc aaa ata cct atg gga gtg	288
Tyr Ser His Pro Ile Val Leu Gly Phe Arg Lys Ile Pro Met Gly Val	
85 90 95	
ggc ctc agt ccg ttt ctc ttg gct cag ttt act agt gcc att tgt tca	336
Gly Leu Ser Pro Phe Leu Leu Ala Gln Phe Thr Ser Ala Ile Cys Ser	
100 105 110	
gtg gtt cgt agg gct ttc ccc cac tgt ttg gct ttc agc tat atg gat	384
Val Val Arg Arg Ala Phe Pro His Cys Leu Ala Phe Ser Tyr Met Asp	
115 120 125	
gat gtg gta ttg ggg gcc aag tct gta cag cat cgt gag gcc ctt tat	432
Asp Val Val Leu Gly Ala Lys Ser Val Gln His Arg Glu Ala Leu Tyr	
130 135 140	
acc gct gtt acc aat ttt ctt ttg tct ctg ggt ata cat tta aac cct	480
Thr Ala Val Thr Asn Phe Leu Leu Ser Leu Gly Ile His Leu Asn Pro	
145 150 155 160	
aac aaa aca aaa aga tgg ggt tat tcc cta aac ttc atg ggt tac ata	528
Asn Lys Thr Lys Arg Trp Gly Tyr Ser Leu Asn Phe Met Gly Tyr Ile	
165 170 175	
att gga agt tgg gga aca ttg c	550
Ile Gly Ser Trp Gly Thr Leu	
180	

<210> 18

30 34

C

<211> 183
<212> PRT
<213> Hepatitis B virus

<400> 18

Ser Ser Asn Leu Ser Trp Leu Ser Leu Asp Val Ser Ala Ala Phe Tyr
1 5 10 15
His Ile Pro Leu His Pro Ala Ala Met Pro His Leu Leu Ile Gly Ser
20 25 30
Ser Gly Leu Ser Arg Tyr Val Ala Arg Leu Ser Ser Asn Ser Arg Ile
35 40 45
Asn Asn Asn Met Gln Asn Leu His Asp Ser Cys Ser Arg Gln Leu Tyr
50 55 60
Val Ser Leu Met Leu Leu Tyr Lys Thr Tyr Gly Glu Lys Leu His Leu
65 70 75 80
Tyr Ser His Pro Ile Val Leu Gly Phe Arg Lys Ile Pro Met Gly Val
85 90 95
Gly Leu Ser Pro Phe Leu Leu Ala Gln Phe Thr Ser Ala Ile Cys Ser
100 105 110
Val Val Arg Arg Ala Phe Pro His Cys Leu Ala Phe Ser Tyr Met Asp
115 120 125
Asp Val Val Leu Gly Ala Lys Ser Val Gln His Arg Glu Ala Leu Tyr
130 135 140
Thr Ala Val Thr Asn Phe Leu Leu Ser Leu Gly Ile His Leu Asn Pro
145 150 155 160
Asn Lys Thr Lys Arg Trp Gly Tyr Ser Leu Asn Phe Met Gly Tyr Ile
165 170 175
Ile Gly Ser Trp Gly Thr Leu
180

<210> 19
<211> 550
<212> DNA
<213> Hepatitis B virus

<220>
<221> CDS
<222> (2)..(472)

<220>
<221> CDS
<222> (476)..(508)

<220>

31 35

C

<221> CDS

<222> (512)..(526)

<220>

<221> CDS

<222> (530)..(550)

<400> 19

t ctt cca att tgt cct ggt tat cgc tgg atg tgt ctg cgg cgt ttt atc 49

Leu Pro Ile Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile

1

5

10

15

ata ttc ctc ttc atc ctg ctg cta tgc ctc atc ttc tta ttg gtt ctt 97

Ile Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val Leu

20

25

30

ctg gat tat caa ggt atg ttg ccc gtt tgt cct cta att cca gga tca 145

Leu Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Ile Pro Gly Ser

35

40

45

aca aca aca tgc aaa acc tgc acg act cct gct caa ggc aac tct acg 193

Thr Thr Thr Cys Lys Thr Cys Thr Thr Pro Ala Gln Gly Asn Ser Thr

50

55

60

ttt ccc tca tgt tgc tgt aca aaa cct acg gag aga aat tgc acc tgt 241

Phe Pro Ser Cys Cys Cys Thr Lys Pro Thr Glu Arg Asn Cys Thr Cys

65

70

75

80

att ccc atc cca tcg tcc tgg gct ttc gca aaa tac cta tgg gag tgg 289

Ile Pro Ile Pro Ser Ser Trp Ala Phe Ala Lys Tyr Leu Trp Glu Trp

85

90

95

gcc tca gtc cgt ttc tct tgg ctc agt tta cta gtg cca ttt gtt cag 337

Ala Ser Val Arg Phe Ser Trp Leu Ser Leu Leu Val Pro Phe Val Gln

100

105

110

tgg ttc gta ggg ctt tcc ccc act gtt tgg ctt tca gct ata tgg atg 385

Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu Ser Ala Ile Trp Met

115

120

125

atg tgg tat tgg ggg cca agt ctg tac agc atc gtg agg ccc ttt ata 433

Met Trp Tyr Trp Gly Pro Ser Leu Tyr Ser Ile Val Arg Pro Phe Ile

130

135

140

ccg ctg tta cca att ttc ttt tgt ctc tgg gta tac att taa acc cta 481

Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val Tyr Ile Thr Leu

145

150

155

aca aaa caa aaa gat ggg gtt att ccc taa act tca tgg gtt aca taa 529

Thr Lys Gln Lys Asp Gly Val Ile Pro Thr Ser Trp Val Thr

160

165

170

ttg gaa gtt ggg gaa cat tgc

Leu Glu Val Gly Glu His Cys

175

180

550



<210> 20
<211> 157
<212> PRT
<213> Hepatitis B virus

<400> 20
Leu Pro Ile Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile
1 5 10 15
Ile Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val Leu
20 25 30
Leu Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Ile Pro Gly Ser
35 40 45
Thr Thr Thr Cys Lys Thr Cys Thr Thr Pro Ala Gln Gly Asn Ser Thr
50 55 60
Phe Pro Ser Cys Cys Cys Thr Lys Pro Thr Glu Arg Asn Cys Thr Cys
65 70 75 80
Ile Pro Ile Pro Ser Ser Trp Ala Phe Ala Lys Tyr Leu Trp Glu Trp
85 90 95
Ala Ser Val Arg Phe Ser Trp Leu Ser Leu Leu Val Pro Phe Val Gln
100 105 110
Trp Phe Val Gly Leu Ser Pro Thr Val Trp Leu Ser Ala Ile Trp Met
115 120 125
Met Trp Tyr Trp Gly Pro Ser Leu Tyr Ser Ile Val Arg Pro Phe Ile
130 135 140
Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val Tyr Ile
145 150 155

<210> 21
<211> 11
<212> PRT
<213> Hepatitis B virus

<400> 21
Thr Leu Thr Lys Gln Lys Asp Gly Val Ile Pro
1 5 10

<210> 22
<211> 5
<212> PRT
<213> Hepatitis B virus

<400> 22
Thr Ser Trp Val Thr
1 5



<210> 23
<211> 7
<212> PRT
<213> Hepatitis B virus

<400> 23
Leu Glu Val Gly Glu His Cys
1 5

<210> 24
<211> 25
<212> PRT
<213> Hepatitis B virus

<220>
<221> VARIANT
<222> (1)
<223> Xaa = Ser or Ala

<220>
<221> VARIANT
<222> (5)
<223> Xaa = Ile or Val

<220>
<221> VARIANT
<222> (11)
<223> Xaa = Ile or Leu

<220>
<221> VARIANT
<222> (15)
<223> Xaa = Val or Gly

<400> 24
Xaa His Pro Ile Xaa Leu Gly Phe Arg Lys Xaa Pro Met Gly Xaa Gly
1 5 10 15

Leu Ser Pro Phe Leu Leu Ala Gln Phe
20 25

<210> 25
<211> 41
<212> PRT
<213> Hepatitis B virus

<220>
<221> VARIANT
<222> (1)
<223> Xaa = Gln or Lys

<220>
<221> VARIANT

38
38

✓

<222> (3)
<223> Xaa = Tyr or Phe

<220>
<221> VARIANT
<222> (5)
<223> Xaa = Arg or Trp

<220>
<221> VARIANT
<222> (10)
<223> Xaa = Tyr or Leu

<220>
<221> VARIANT
<222> (11)
<223> Xaa = Ser or Ala

<220>
<221> VARIANT
<222> (15)
<223> Xaa = Ile or Val

<220>
<221> VARIANT
<222> (21)
<223> Xaa = Ile or Leu

<220>
<221> VARIANT
<222> (25)
<223> Xaa = Val or Gly

<220>
<221> VARIANT
<222> (40)
<223> Xaa = Cys or Leu

<400> 25
Xaa Thr Xaa Gly Xaa Lys Leu His Leu Xaa Xaa His Pro Ile Xaa Leu
1 5 10 15

Gly Phe Arg Lys Xaa Pro Met Gly Xaa Gly Leu Ser Pro Phe Leu Leu
20 25 30

Ala Gln Phe Thr Ser Ala Ile Xaa Ser
35 40

<210> 26
<211> 11
<212> PRT
<213> Hepatitis B virus

<220>
<221> VARIANT

39 35

C

<222> (1)
<223> Xaa = Ala or Val

<220>
<221> VARIANT
<222> (3)
<223> Xaa = Ser or Ala

<220>
<221> VARIANT
<222> (8)
<223> Xaa = Val or Leu or Met

<400> 26
Xaa Phe Xaa Tyr Met Asp Asp Xaa Val Leu Gly
1 5 10

<210> 27
<211> 30
<212> PRT
<213> Hepatitis B virus

<220>
<221> VARIANT
<222> (1)
<223> Xaa = Ser or Ala

<220>
<221> VARIANT
<222> (5)
<223> Xaa = Ile or Val

<220>
<221> VARIANT
<222> (8)
<223> Xaa = Phe or Leu

<220>
<221> VARIANT
<222> (11)
<223> Xaa = Ile or Leu

<220>
<221> VARIANT
<222> (15)
<223> Xaa = Leu or Val or Gly

<220>
<221> VARIANT
<222> (19)
<223> Xaa = Pro or Leu

<220>
<221> VARIANT
<222> (22)



<223> Xaa = Leu or Met

<220>

<221> VARIANT

<222> (29)

<223> Xaa = Ile or Leu

<220>

<221> VARIANT

<222> (30)

<223> Xaa = Cys or Leu

<400> 27

Xaa	His	Pro	Ile	Xaa	Leu	Gly	Xaa	Arg	Lys	Xaa	Pro	Met	Gly	Xaa	Gly
1				5				10					15		

Leu	Ser	Xaa	Phe	Leu	Xaa	Ala	Gln	Phe	Thr	Ser	Ala	Xaa	Xaa
			20					25					30

<210> 28

<211> 14

<212> PRT

<213> Hepatitis B virus

<220>

<221> VARIANT

<222> (1)

<223> Xaa = Ala or Val

<220>

<221> VARIANT

<222> (3)

<223> Xaa = Ser or Ala

<220>

<221> VARIANT

<222> (5)

<223> Xaa = Met or Ile or Val

<220>

<221> VARIANT

<222> (8)

<223> Xaa = Val or Leu or Met

<220>

<221> VARIANT

<222> (13)

<223> Xaa = Lys or Arg

<220>

<221> VARIANT

<222> (14)

<223> Xaa = Ser or Thr

<400> 28

41 37

✓

Xaa Phe Xaa Tyr Xaa Asp Asp Xaa Val Leu Gly Ala Xaa Xaa
1 5 10

<210> 29
<211> 181
<212> PRT
<213> Hepatitis B virus

<220>
<221> VARIANT
<222> (2)
<223> Xaa = Asn or Asp

<220>
<221> VARIANT
<222> (17)
<223> Xaa = Ile or Pro

<220>
<221> VARIANT
<222> (29)
<223> Xaa = Ile or Val

<220>
<221> VARIANT
<222> (35)
<223> Xaa = Ser or Asp

<220>
<221> VARIANT
<222> (44)
<223> Xaa = Thr or Asn

<220>
<221> VARIANT
<222> (46)
<223> Xaa = Arg or Asn

<220>
<221> VARIANT
<222> (47)
<223> Xaa = Asn or Ile

<220>
<221> VARIANT
<222> (48)
<223> Xaa = more than 3 different AA possible

<220>
<221> VARIANT
<222> (50)
<223> Xaa = Asn or Tyr or His

<220>
<221> VARIANT

<222> (52)
<223> Xaa = His or Tyr

<220>
<221> VARIANT
<222> (53)
<223> Xaa = Gly or Arg

<220>
<221> VARIANT
<222> (54)
<223> Xaa = more than 3 different AA possible

<220>
<221> VARIANT
<222> (55)
<223> Xaa = more than 3 different AA possible

<220>
<221> VARIANT
<222> (56)
<223> Xaa = more than 3 different AA possible

<220>
<221> VARIANT
<222> (57)
<223> Xaa = Asp or Asn

<220>
<221> VARIANT
<222> (60)
<223> Xaa = Asp or Asn

<220>
<221> VARIANT
<222> (61)
<223> Xaa = Ser or Tyr

<220>
<221> VARIANT
<222> (65)
<223> Xaa = Asn or Gln

<220>
<221> VARIANT
<222> (71)
<223> Xaa = Leu or Met

<220>
<221> VARIANT
<222> (75)
<223> Xaa = Lys or Gln

<220>
<221> VARIANT
<222> (77)
<223> Xaa = Tyr or Phe

39 4/13

✓

<220>
<221> VARIANT
<222> (79)
<223> Xaa = Arg or Trp

<220>
<221> VARIANT
<222> (84)
<223> Xaa = Tyr or Leu

<220>
<221> VARIANT
<222> (85)
<223> Xaa = Ser or Ala

<220>
<221> VARIANT
<222> (89)
<223> Xaa = Ile or Val

<220>
<221> VARIANT
<222> (95)
<223> Xaa = Ile or Leu

<220>
<221> VARIANT
<222> (99)
<223> Xaa = Val or Gly

<220>
<221> VARIANT
<222> (114)
<223> Xaa = Cys or Leu

<220>
<221> VARIANT
<222> (115)
<223> Xaa = Ala or Ser

<220>
<221> VARIANT
<222> (116)
<223> Xaa = Val or Met

<220>
<221> VARIANT
<222> (117)
<223> Xaa = Val or Thr

<220>
<221> VARIANT
<222> (118)
<223> Xaa = Arg or Cys

<220>

4044

✓

<221> VARIANT
<222> (122)
<223> Xaa = Phe or Pro

<220>
<221> VARIANT
<222> (125)
<223> Xaa = Leu or Val

<220>
<221> VARIANT
<222> (126)
<223> Xaa = Ala or Val

<220>
<221> VARIANT
<222> (128)
<223> Xaa = Ser or Ala

<220>
<221> VARIANT
<222> (133)
<223> Xaa = Val or Leu or Met

<220>
<221> VARIANT
<222> (138)
<223> Xaa = Lys or Arg

<220>
<221> VARIANT
<222> (139)
<223> Xaa = Ser or Thr

<220>
<221> VARIANT
<222> (140)
<223> Xaa = Val or Gly

<220>
<221> VARIANT
<222> (141)
<223> Xaa = Gln or Glu

<220>
<221> VARIANT
<222> (143)
<223> Xaa = Leu or Ser or Arg

<220>
<221> VARIANT
<222> (145)
<223> Xaa = Ser or Phe

<220>
<221> VARIANT
<222> (147)

<223> Xaa = Phe or Tyr

<220>

<221> VARIANT

<222> (148)

<223> Xaa = Thr or Ala

<220>

<221> VARIANT

<222> (149)

<223> Xaa = Ala or Ser

<220>

<221> VARIANT

<222> (150)

<223> Xaa = Val or Ile

<220>

<221> VARIANT

<222> (151)

<223> Xaa = Thr or Cys

<220>

<221> VARIANT

<222> (152)

<223> Xaa = Asn or Ser

<220>

<221> VARIANT

<222> (153)

<223> Xaa = Phe or Val

<220>

<221> VARIANT

<222> (156)

<223> Xaa = Ser or Asp

<220>

<221> VARIANT

<222> (157)

<223> Xaa = Leu or Val

<220>

<221> VARIANT

<222> (164)

<223> Xaa = Asn or Gln

<220>

<221> VARIANT

<222> (179)

<223> Xaa = Val or Ile

<220>

<400> 29

Ser Xaa Leu Ser Trp Leu Ser Leu Asp Val Ser Ala Ala Phe Tyr His

1

5

10

15

42 46

C

Xaa Pro Leu His Pro Ala Ala Met Pro His Leu Leu Xaa Gly Ser Ser
 20 25 30
 Gly Leu Xaa Arg Tyr Val Ala Arg Leu Ser Ser Xaa Ser Xaa Xaa Xaa
 35 40 45
 Asn Xaa Gln Xaa Xaa Xaa Xaa Xaa Xaa Leu His Xaa Xaa Cys Ser Arg
 50 55 60
 Xaa Leu Tyr Val Ser Leu Xaa Leu Leu Tyr Xaa Thr Xaa Gly Xaa Lys
 65 70 75 80
 Leu His Leu Xaa Xaa His Pro Ile Xaa Leu Gly Phe Arg Lys Xaa Pro
 85 90 95
 Met Gly Xaa Gly Leu Ser Pro Phe Leu Leu Ala Gln Phe Thr Ser Ala
 100 105 110
 Ile Xaa Xaa Xaa Xaa Xaa Arg Ala Phe Xaa His Cys Xaa Xaa Phe Xaa
 115 120 125
 Tyr Met Asp Asp Xaa Val Leu Gly Ala Xaa Xaa Xaa Xaa His Xaa Glu
 130 135 140
 Xaa Leu Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Leu Leu Xaa Xaa Gly Ile His
 145 150 155 160
 Leu Asn Pro Xaa Lys Thr Lys Arg Trp Gly Tyr Ser Leu Asn Phe Met
 165 170 175
 Gly Tyr Xaa Ile Gly
 180

<210> 30
 <211> 4
 <212> PRT
 <213> Hepatitis B virus

<400> 30
 Tyr Met Asp Asp
 1

<210> 31
 <211> 11
 <212> PRT
 <213> Hepatitis B virus

<400> 31
 Ala Phe Ser Tyr Met Asp Asp Val Val Leu Gly
 1 5 10



<210> 32
<211> 11
<212> PRT
<213> Hepatitis B virus

<400> 32
Ala Phe Ser Tyr Met Asp Asp Val Val Leu Gly
1 5 10

<210> 33
<211> 11
<212> PRT
<213> Hepatitis B virus

<400> 33
Val Phe Ala Tyr Met Asp Asp Leu Val Leu Gly
1 5 10

<210> 34
<211> 11
<212> PRT
<213> Hepatitis B virus

<400> 34
Ile Tyr Gln Tyr Met Asp Asp Leu Tyr Val Gly
1 5 10

<210> 35
<211> 33
<212> PRT
<213> Hepatitis B virus

<400> 35
Thr Thr Ile Gly Arg Glu Met Leu Leu Ala Thr Arg Glu Tyr Val His
1 5 10 15

Ala Arg Trp Ala Ala Phe Glu Gln Leu Leu Ala Asp Phe Pro Glu Ala
20 25 30

Ala

<210> 36
<211> 41
<212> PRT
<213> Hepatitis B virus

<400> 36

44 48

C

Gln Thr Phe Gly Arg Lys Leu His Leu Tyr Ser His Pro Ile Ile Leu
1 5 10 15

Gly Phe Arg Lys Ile Pro Met Gly Leu Gly Leu Ser Leu Phe Leu Met
20 25 30

Ala Gln Phe Thr Ser Ala Ile Cys Ser
35 40

<210> 37
<211> 41
<212> PRT
<213> Hepatitis B virus

<400> 37
Gln Thr Phe Gly Arg Lys Leu His Leu Tyr Ser His Pro Ile Ile Leu
1 5 10 15

Gly Phe Arg Lys Ile Pro Met Gly Val Gly Leu Ser Pro Phe Leu Met
20 25 30

Ala Gln Phe Thr Ser Ala Ile Cys Ser
35 40

<210> 38
<211> 41
<212> PRT
<213> Hepatitis B virus

<400> 38
Gln Thr Phe Gly Arg Lys Leu His Leu Tyr Ser His Pro Ile Ile Leu
1 5 10 15

Gly Leu Arg Lys Ile Pro Met Gly Val Gly Leu Ser Pro Phe Leu Met
20 25 30

Ala Gln Phe Thr Ser Ala Ile Cys Ser
35 40

<210> 39
<211> 41
<212> PRT
<213> Hepatitis B virus

<400> 39
Gln Thr Phe Gly Arg Lys Leu His Leu Tyr Ser His Pro Ile Val Leu
1 5 10 15

Gly Phe Arg Lys Ile Pro Met Gly Val Gly Leu Ser Pro Phe Leu Leu
20 25 30

45 49

Ala Gln Phe Thr Ser Ala Leu Cys Ser
35 40

<210> 40
<211> 14
<212> PRT
<213> Hepatitis B virus

<400> 40
Ala Phe Ser Tyr Met Asp Asp Val Val Leu Gly Ala Lys Thr
1 5 10

<210> 41
<211> 31
<212> PRT
<213> Hepatitis B virus

<220>
<221> VARIANT
<222> (1)
<223> Xaa = Ser or Ala

<220>
<221> VARIANT
<222> (5)
<223> Xaa = Ile or Val

<220>
<221> VARIANT
<222> (11)
<223> Xaa = Ile or Leu

<220>
<221> VARIANT
<222> (15)
<223> Xaa = Val or Gly

<400> 41
Xaa His Pro Ile Xaa Leu Gly Phe Arg Lys Xaa Pro Met Gly Xaa Gly
1 5 10 15

Leu Ser Pro Phe Leu Leu Ala Gln Phe Thr Ser Ala Ile Cys Ser
20 25 30

<210> 42
<211> 40
<212> PRT
<213> Hepatitis B virus

<220>
<221> VARIANT

46 50

✓

<222> (1)
<223> Xaa = Gln or Lys

<220>
<221> VARIANT
<222> (3)
<223> Xaa = Tyr or Phe

<220>
<221> VARIANT
<222> (5)
<223> Xaa = Arg or Trp or Glu

<220>
<221> VARIANT
<222> (10)
<223> Xaa = Tyr or Leu

<220>
<221> VARIANT
<222> (11)
<223> Xaa = Ser or Ala

<220>
<221> VARIANT
<222> (15)
<223> Xaa = Ile or Val

<220>
<221> VARIANT
<222> (18)
<223> Xaa = Phe or Leu

<220>
<221> VARIANT
<222> (21)
<223> Xaa = Ile or Leu

<220>
<221> VARIANT
<222> (25)
<223> Xaa = Leu or Val or Glu

<220>
<221> VARIANT
<222> (29)
<223> Xaa = Pro or Leu

<220>
<221> VARIANT
<222> (32)
<223> Xaa = Leu or Met

<220>
<221> VARIANT
<222> (39)
<223> Xaa = Ile or Leu



<220>

<221> VARIANT

<222> (40)

<223> Xaa = Cys or Leu

<400> 42

Xaa Thr Xaa Gly Xaa Lys Leu His Leu Xaa Xaa His Pro Ile Xaa Leu
1 5 10 15

Gly Xaa Arg Lys Xaa Pro Met Gly Xaa Gly Leu Ser Xaa Phe Leu Xaa
20 25 30

Ala Gln Phe Thr Ser Ala Xaa Xaa
35 40

<210> 43

<211> 14

<212> PRT

<213> Hepatitis B virus

<220>

<221> VARIANT

<222> (1)

<223> Xaa = Ala or Val

<220>

<221> VARIANT

<222> (3)

<223> Xaa = Ser or Ala

<220>

<221> VARIANT

<222> (5)

<223> Xaa = Met or Ile or Val

<220>

<221> VARIANT

<222> (8)

<223> Xaa = Val or Leu or Met

<220>

<221> VARIANT

<222> (13)

<223> Xaa = Lys or Arg

<220>

<221> VARIANT

<222> (14)

<223> Xaa = Ser or Thr

<400> 43

Xaa Phe Xaa Tyr Xaa Asp Asp Xaa Val Leu Gly Ala Xaa Xaa
1 5 10

48 52

C

<210> 44
<211> 31
<212> PRT
<213> Hepatitis B virus

<220>
<221> VARIANT
<222> (1)
<223> Xaa = Ser or Ala

<220>
<221> VARIANT
<222> (5)
<223> Xaa = Ile or Val

<220>
<221> VARIANT
<222> (11)
<223> Xaa = Ile or Leu

<220>
<221> VARIANT
<222> (15)
<223> Xaa = Val or Gly

<220>
<221> VARIANT
<222> (30)
<223> Xaa = Cys or Leu

<400> 44
Xaa His Pro Ile Xaa Leu Gly Phe Arg Lys Xaa Pro Met Gly Xaa Gly
1 5 10 15

Leu Ser Pro Phe Leu Leu Ala Gln Phe Thr Ser Ala Ile Xaa Ser
20 25 30

<210> 45
<211> 14
<212> PRT
<213> Hepatitis B virus

<220>
<221> VARIANT
<222> (1)
<223> Xaa = Ala or Val

<220>
<221> VARIANT
<222> (3)
<223> Xaa = Ser or Ala

<220>

<221> VARIANT

<222> (8)

<223> Xaa = Val or Leu or Met

<220>

<221> VARIANT

<222> (13)

<223> Xaa = Lys or Arg

<220>

<221> VARIANT

<222> (14)

<223> Xaa = Ser or Thr

<400> 45

Xaa Phe Xaa Tyr Met Asp Asp Xaa Val Leu Gly Ala Xaa Xaa
1 5 10

<210> 46

<211> 11

<212> PRT

<213> Hepatitis B virus

<400> 46

Ala Phe Ser Tyr Met Asp Asp Val Val Leu Gly
1 5 10

<210> 47

<211> 11

<212> PRT

<213> Hepatitis B virus

<400> 47

Ala Phe Ser Tyr Met Asp Asp Val Val Leu Gly
1 5 10

<210> 48

<211> 11

<212> PRT

<213> Hepatitis B virus

<220>

<221> VARIANT

<222> (5)

<223> Xaa = Val or Ile

<400> 48

Ala Phe Ser Tyr Xaa Asp Asp Val Val Leu Gly
1 5 10

50 54

✓

<210> 49
<211> 11
<212> PRT
<213> Hepatitis B virus

<400> 49
Ala Phe Ser Tyr Met Asp Asp Val Val Leu Gly
1 5 10

<210> 50
<211> 16
<212> PRT
<213> Hepatitis B virus

<400> 50
Ser Asp Leu Ser Trp Leu Ser Leu Asp Val Ser Ala Ala Phe Tyr His
1 5 10 15

<210> 51
<211> 16
<212> PRT
<213> Hepatitis B virus

<400> 51
Ser Asp Leu Ser Trp Leu Ser Leu Asp Val Ser Ala Ala Phe Tyr His
1 5 10 15

<210> 52
<211> 16
<212> PRT
<213> Hepatitis B virus

<400> 52
Thr Asp Leu Gln Trp Leu Ser Leu Asp Val Ser Ala Ala Phe Tyr His
1 5 10 15

<210> 53
<211> 16
<212> PRT
<213> Hepatitis B virus

<400> 53
Lys Lys Lys Ser Val Thr Val Leu Asp Val Gly Asp Ala Tyr Phe Ser
1 5 10 15

<210> 54

51 55

C

<211> 41
<212> PRT
<213> Hepatitis B virus

<400> 54
Gln Thr Phe Gly Arg Lys Leu His Leu Tyr Ser His Pro Ile Ile Leu
1 5 10 15
Gly Phe Arg Lys Ile Pro Met Gly Val Gly Leu Ser Pro Phe Leu Leu
20 25 30
Ala Gln Phe Thr Ser Ala Ile Cys Ser
35 40

<210> 55
<211> 41
<212> PRT
<213> Hepatitis B virus

<400> 55
Gln Thr Phe Gly Arg Lys Leu His Leu Tyr Ser His Pro Ile Ile Leu
1 5 10 15
Gly Phe Arg Lys Ile Pro Met Gly Leu Gly Leu Ser Leu Phe Leu Met
20 25 30
Ala Gln Phe Thr Ser Ala Ile Cys Ser
35 40

<210> 56
<211> 41
<212> PRT
<213> Hepatitis B virus

<400> 56
Lys Thr Tyr Gly Arg Lys Leu His Leu Leu Ala His Pro Phe Ile Met
1 5 10 15
Gly Phe Arg Lys Leu Phe Met Gly Val Gly Leu Ser Pro Phe Leu Leu
20 25 30
Ala Gln Phe Thr Ser Ala Leu Ala Ser
35 40

<210> 57
<211> 27
<212> PRT
<213> Hepatitis B virus

<400> 57
Arg Tyr Gln Tyr Asn Val Leu Pro Gln Gly Trp Lys Gly Ser Pro Ala

5-25p

✓

1

5

10

15

Ile Phe Gln Ser Ser Met Thr Lys Ile Leu Glu
20 25

C2
WA

53 57

✓